When, however, the author remarks in conclusion, all the lines of curvature issuing from the umbilic are equally close to the osculating sphere, then these successive differentiations will either at length exhaust the coefficients, and thus no determinate equation will arise ; or else they will conduct to an equation whose roots are all imaginary : and one or other of these circumstances must always take place at the vertex of a surface of revolution.

The Society adjourned over the Christmas Recess to meet again on the 10th January next.

January 10, 1839.

JOHN WILLIAM LUBBOCK, Esq., V.P. and Treas.,
in the Chair.

William James Frodsham, and John Hilton, Esquires, were severally elected Fellows of the Society.

A paper was read, entitled, " On the Laws of Mortality." By Charles Jellicoe, Esq. Communicated by P. M. Roget, M.D., Sec. R.S.

The author, considering that the variations and discrepancies in the annual decrements of life which are exhibited in the tables of mortality hitherto published would probably disappear, and that these decrements would follow a perfectly regular and uniform law, if the observations on which they are founded were sufficiently numerous, endeavours to arrive at an approximation to such a law, by proper interpolations in the series of the numbers of persons living at every tenth year of human life. The method he proposes, for the attainment of this object, is that of taking, by proper formulæ, the successive orders of differences, until the last order either disappears, or may be assumed equal to zero. With the aid of such differences, of which, by applying these formulæ, he gives the calculation, he constructs tables of the annual decrements founded principally on the results of the experience of the Equitable Assurance Society.

January 17, 1839.

JOHN FORBES ROYLE, M.D., V.P., in the Chair.

Beriah Botfield, and Peter Hardy, Esquires, were severally elected Fellows of the Society.

A paper was read, entitled, " On the state of the Interior of the Earth." By W. Hopkins, Esq. A.M., F.R.S., Second Memoir. " On the Phenomena of Precession and Nutation, assuming the Fluidity of the Interior of the Earth."

In this memoir the author investigates the amount of the luni-solar precession and nutation, assuming the earth to consist of a solid spheroidal shell filled with fluid. For the purpose of presenting the problem under its most simple form, he first supposes the solid shell to be bounded by a determinate inner spheroidal surface, of which the ellipticity is equal to that of the outer surface ; the change from the solidity of the shell to the fluidity of the included mass being, not gradual, but abrupt. He also here supposes both the shell and the fluid to be homogeneous, and of equal density. The author then gives the statement of the problem which he proposes to investigate ; the investigation itself, which occupies the remainder of the paper, being wholly analytical, and insusceptible of abridgement. The following, however, are the results to which he is conducted by this laborious process : namely, that, on the hypothesis above stated, 1. The Precession will be the same, whatever be the thickness of the shell, as if the whole earth were homogeneous and solid. 2. The Lunar Nutation will be the same as for the homogeneous spheroid to such a degree of approximation that the difference would be inappreciable to observation. 3. The Solar Nutation will be sensibly the same as for the homogeneous spheroid, unless the thickness of the shell be very nearly of a certain value, namely, something less than one quarter of the earth's radius ; in which case this nutation might become much greater than for the solid spheroid. 4. In addition to the above motions of precession and nutation, the pole of the earth would have a small circular motion, depending entirely on the internal fluidity. The radius of the circle thus described would be greatest when the thickness of the shell was the least : but the inequality thus produced would not, for the smallest thickness of the shell, exceed a quantity of the same order as the polar nutation, and for any but the most inconsiderable thickness of the shell would be entirely inappreciable to observation.

In his next communication, the author purposes considering the case in which both the solid shell and the inclosed fluid mass are of variable density.

" Apperçu sur une manière nouvelle d'envisager la théorie cristallographique dans le but d'établir les rapports de celle-ci avec la forme sphérique, ou elliptique, des molécules, ainsi qu'avec l'effet des milieux sur la forme cristalline." Par M. L. A. Necker. Communicated by P. M. Roget, M.D., Sec. R.S.

In this communication, after adverting to Haüy's theory of crystallization, in which the molecules are considered to be polyhedrons, to the views subsequently taken by Wollaston and Davy, and particularly to Brewster's conclusions, that there ought to be different forms of molecules, some spherical, some elliptical with two equal axes, and a third unequal to these, and others elliptical with three unequal axes ; M. Necker states, that Mr. Dana is the only mineralogist who has attempted to introduce into crystallography the consideration of molecules with curved surfaces. Although, adopting the forms proposed by Brewster, and adding to them those